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**London, WC2A 1HZ(GB)**(54) **Aluminium batteries.**

(57) An aluminium battery comprises an aqueous alkaline electrolyte and an anode which is an alloy of aluminium containing magnesium and/or calcium. Tin is present in the electrolyte (as stannate at a concentration of 0.001 to 0.01 M) and/or in the anode (at a concentration of at least 0.005%). The batteries operate at high coulombic efficiency at both high and low current densities. Preferred conditions of operation comprise drawing current at an average current density of 5 to 400 mA/cm<sup>2</sup> of anode surface for at least one hour, and introducing seed crystals into the electrolyte to aid precipitation of aluminium values from the electrolyte.

**EP 0 354 752 A3**



# EUROPEAN SEARCH REPORT

EP 89 30 8023

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
D,X	EP-A-0 209 402 (ALCAN INTERNATIONAL LTD) * Abstract; column 2, lines 8-50; column 5, table I: Alloy no. 7; column 7, table 2; claims * - - -	1-3,5	H 01 M 4/46 H 01 M 12/06 C 22 C 21/00 H 01 M 6/04
D,X	GB-A-2 020 478 (ELECTROCHEM. INC.) * Page 1, lines 44-98; page 2, examples II,III; claims 1,3,4 * - - -	1-3	
Y		7-10	
Y	PROCEEDINGS OF THE 20TH INTERSOCIETY ENERGY CONVERSION ENGINEERING CONFERENCE, Energy for the twenty-first century, SAE P-164, vol. 2, August 1985, pages 2.14-2.20; A. MAIMONI: "Aluminium-air power cell - A progress report" * Page 2.14, left-hand column, paragraph 2 - page 2.15, left-hand column, paragraph 1; page 2.16, left-hand column, paragraph: "Integrated experiments" * - - -	7-10	
A	EXTENDED ABSTRACTS, vol. 88-1, 15th - 20th May 1988, page 16, abstract no. 11; L.K. MITCHELL et al.: "Effect of varied alloy concentrations on performance for aluminum-air battery anodes" * Whole document * - - -	1-3,5,7	
A	CHEMICAL ABSTRACTS, vol. 91, 1979, page 528, abstract no. 219386t, Columbus, Ohio, US; & JP-A-79 110 909 (SUMITOMO LIGHT METAL INDUSTRIES, LTD) 30-08-1979 * Whole abstract * - - -	1,4,6	H 01 M 4/46 H 01 M 12/06 C 22 C 21/00
A	JOURNAL OF POWER SOURCES, vol. 22, 1988, pages 261-267; M.J. NIKSA et al.: "Aluminum-oxygen batteries for space applications" * Summary; pages 261-262, paragraph 1; page 263, paragraph: "Anode development" * - - - -/-	1,8-10	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of search 31 January 91	Examiner DE VOS L.A.R.
CATEGORY OF CITED DOCUMENTS X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention		E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons ----- &: member of the same patent family, corresponding document	



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Application Number

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
D,A	US-A-3 189 486 (M.J. PRYOR) * Whole document * -----	1-7	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
The present search report has been drawn up for all claims			
Place of search		Date of completion of search	Examiner
The Hague		31 January 91	DE VOS L.A.R.
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X: particularly relevant if taken alone  Y: particularly relevant if combined with another document of the same category  A: technological background  O: non-written disclosure  P: intermediate document  T: theory or principle underlying the invention</p> <p>E: earlier patent document, but published on, or after the filing date  D: document cited in the application  L: document cited for other reasons</p> <p>&amp;: member of the same patent family, corresponding document</p>			